

Interferometric Star Tracker - PhaseII, Phase II

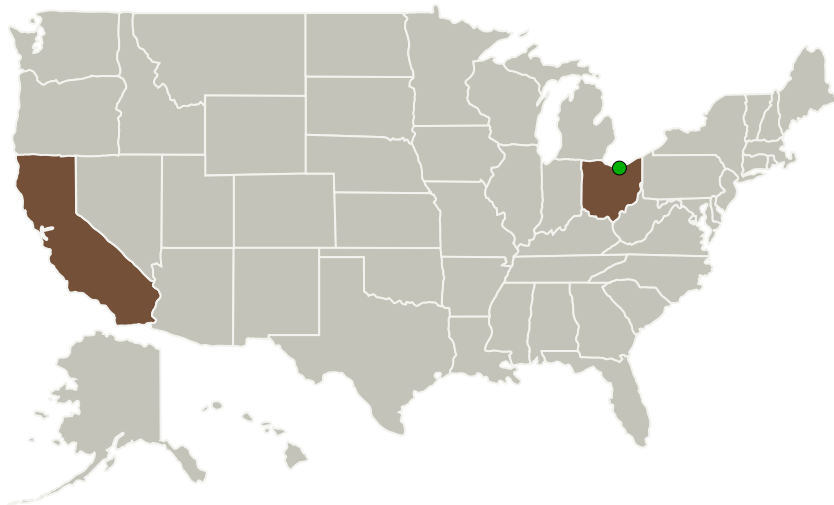
Completed Technology Project (2015 - 2019)



Project Introduction

Laser communications (Lasercom) technology offers the promise of much higher rate data exchanges while reducing the size and weight of the telecommunications package for deep space missions. This improved system performance is due primarily to the narrow transmit signal beamwidth at the optical wavelength, which allows for more efficient delivery of the transmit signal to the receiver. The problem of pointing a laser signal can in general be decomposed into the problems of (i) stabilizing the optical line of sight and (ii) providing the appropriate pointing reference to the receiver location. Optical Physics Company (OPC) has adapted the precision interferometric star tracker it is currently developing under several DoD contracts for deep space lasercom beam pointing applications. The OPC interferometric star tracker can also be used to provide precise attitude measurements to the spacecraft for navigation and orbit determination purposes. The current concept for the beam pointing is for a star tracker to be mounted opposite to the downlink beam boresight. This configuration has the advantage that, for outer planet missions, the sun will almost always be away from the tracker, thus allowing the tracker to have a direct view of the sky.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Optical Physics Company	Lead Organization	Industry	Calabasas, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

California	Ohio
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Project Transitions

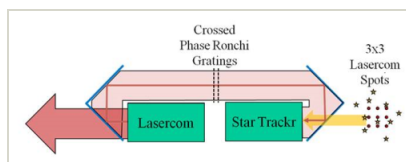
▶ **June 2015:** Project Start

✓ **August 2019:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138233>)

Images



Briefing Chart

Interferometric Star Tracker - PhaseII Briefing Chart

(<https://techport.nasa.gov/image/134158>)



Final Summary Chart Image

Interferometric Star Tracker - PhaseII, Phase II

(<https://techport.nasa.gov/image/128058>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Optical Physics Company

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

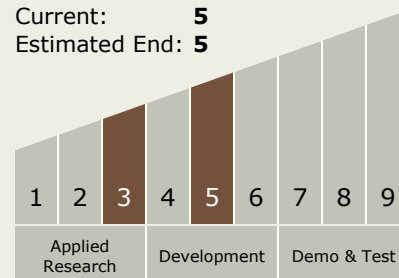
Richard A Hutchin

Technology Maturity (TRL)

Start: 3

Current: 5

Estimated End: 5



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.1 Optical Communications
 - └ TX05.1.4 Pointing, Acquisition and Tracking (PAT)

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System